

38. The method according to claim 37 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

Copies of specification pages 26-27, amended in accordance with the claim amendments described above, are enclosed will be provided.

REMARKS:

As the examiner can see, the claims have been amended to state the essential elements of applicants' invention. Support for the claim amendments may be found on, for example, page 7 of the application as filed.

Claims 28-34 were rejected under 35 USC 112. Applicants believe that the amendments to claim 28 overcome this objection.

Claim 28 was rejected under 35 USC 102 as anticipated by Jacobsen-Lyon et al. Applicant notes that the cited reference found expression of nonsymbiotic hemoglobin in some plant tissues. However, this reference does not teach improving agronomic properties of a plant by providing the plant increased levels of nonsymbiotic hemoglobin. Rather, this reference analyzed the promoter of a nonsymbiotic hemoglobin gene using reporter gene constructs. Furthermore, applicants note that on page 219, first paragraph, last 3 lines, Jacobsen-Lyon states "until we have mutant plants available, we will not be certain of the function of plant hemoglobins in non-symbiotic tissues". Thus, Jacobsen-Lyon does not teach that there would be any benefit to increasing levels of non-symbiotic hemoglobin in a plant cell. Applicants believe that in view

of the above arguments and the amendments to claim 28, this rejection is overcome.

Claims 28-38 were rejected under 35 USC 103(a) in view of Bailey and Sowa. Applicant notes that as stated in the information disclosure statement filed January, 2002, the Sowa reference appeared in the August 1998 issue of Proceedings of the National Academy of Sciences USA and is therefore not prior art, as the provisional application on which the instant application claims priority on (60/090,929) was filed on June 26, 1998, prior to the publication of this reference.

The examiner's assistance and helpfulness in this matter has been greatly appreciated. Further and more favorable consideration of the application in view of the amendments is respectfully requested.

Respectfully submitted
Philip Guy et al.

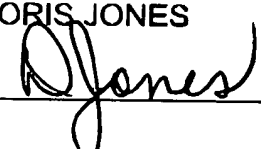
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DORIS JONES



DATE: May 7, 2002

CLAIMS

28. A method of improving the agronomic properties of a plant comprising:

5 maintaining plant vigor and hardiness under stressful conditions by
providing [a] the plant [having] with increased cellular levels of a nonsymbiotic plant hemoglobin; and

growing the plant under stressful conditions, thereby allowing the
plant to develop more vigorously under adverse conditions.

29. The method according to claim 28 wherein the nonsymbiotic
10 plant hemoglobin is barley nonsymbiotic hemoglobin.

30. The method according to claim 28 wherein the improved agronomic properties include germination.

31. The method according to claim 28 wherein the improved agronomic properties include seedling vigour.

15 32. The method according to claim 28 wherein the improved agronomic properties include reduced cellular levels of fermentation products.

33. The method according to claim 28 wherein the improved agronomic properties include increased oxygen uptake.

34. The method according to claim 28 wherein the improved
20 agronomic properties include increased tolerance to hypoxic conditions.

35. A method of selecting seeds for breeding to produce seed lines having desirable characteristics comprising:

 providing a representative seed of a given seed line;

 growing the seed such that the seed germinates;

25 isolating an extract from the seed;

 measuring levels of nonsymbiotic plant hemoglobin expression within the extract; and

 selecting or rejecting the seed for further breeding based on the hemoglobin levels.

30 36. The method according to claim 35 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

37. A method of determining if a seed is germinating comprising:

- 27 -

providing a seed suspected of germinating;
isolating an extract from the seed; and
measuring levels of nonsymbiotic plant hemoglobin expression
within the extract,

5 wherein high levels of nonsymbiotic plant hemoglobin expression
indicate that the seed is germinating.

38. The method according to claim 37 wherein the nonsymbiotic
plant hemoglobin is barley nonsymbiotic hemoglobin.

CLAIMS

28. A method of improving the agronomic properties of a plant comprising:

maintaining plant vigor and hardiness under stressful conditions by
5 providing the plant with increased cellular levels of a nonsymbiotic plant hemoglobin; and

growing the plant under stressful conditions, thereby allowing the plant to develop more vigorously under adverse conditions.

29. The method according to claim 28 wherein the nonsymbiotic
10 plant hemoglobin is barley nonsymbiotic hemoglobin.

30. The method according to claim 28 wherein the improved agronomic properties include germination.

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measuring levels of nonsymbiotic plant hemoglobin expression within the extract; and

selecting or rejecting the seed for further breeding based on the hemoglobin levels.

30 36. The method according to claim 35 wherein the nonsymbiotic plant hemoglobin is barley nonsymbiotic hemoglobin.

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- 27 -

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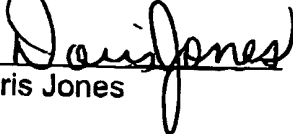
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DORIS JONES


Doris JonesDATE: May 7, 2002